



FCI/GB 2004 / 0 0 0 0 5 6



INVESTOR IN PEOPLE

The Patent Office
Concept House
Cardiff Road
Newport
South Wales
NP10 8QQ

**PRIORITY
DOCUMENT**
SUBMITTED OR TRANSMITTED IN
COMPLIANCE WITH RULE 17.1(a) OR (b)

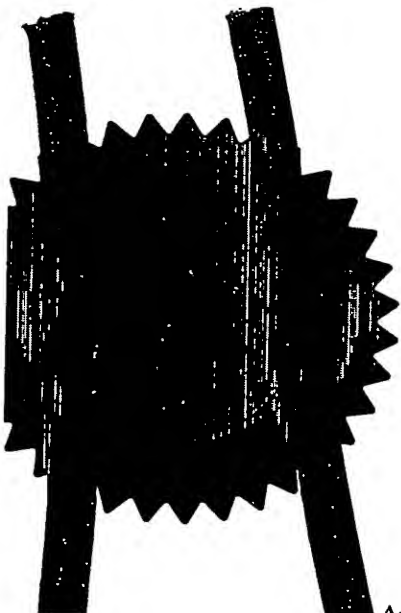
RECEIVED	
26 FEB 2004	
WIPO	PCT

I, the undersigned, being an officer duly authorised in accordance with Section 74(1) and (4) of the Deregulation & Contracting Out Act 1994, to sign and issue certificates on behalf of the Comptroller-General, hereby certify that annexed hereto is a true copy of the documents as originally filed in connection with the patent application identified therein.

In accordance with the Patents (Companies Re-registration) Rules 1982, if a company named in this certificate and any accompanying documents has re-registered under the Companies Act 1980 with the same name as that with which it was registered immediately before re-registration save for the substitution as, or inclusion as, the last part of the name of the words "public limited company" or their equivalents in Welsh, references to the name of the company in this certificate and any accompanying documents shall be treated as references to the name with which it is so re-registered.

In accordance with the rules, the words "public limited company" may be replaced by p.l.c., plc, P.L.C. or PLC.

Re-registration under the Companies Act does not constitute a new legal entity but merely subjects the company to certain additional company law rules.



Signed

Dated 12 January 2004

29 JAN 2003

Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet, from the Patent Office to help you fill in this form)

The Patent Office

Cardiff Road
Newport
Gwent NP9 1RH

1.	Your reference	CDK2085		
2.	Patent application number (The Patent Office will fill in this part)	0301975.9	29JAN03 F780621-6 D02806 P01/7700 0.00-0301975.9	
3.	Full name, address and postcode of the or of each applicant (underline all surnames)	RHODIA CONSUMER SPECIALTIES LIMITED Oak House Reeds Crescent Watford Hertfordshire, WD24 4QP.		
	Patents ADP number (if you know it)	7870322006		
	If the applicant is a corporate body, give the country/state of its incorporation	England		
4.	Title of the invention	TREATING SLURRIES		
5.	Name of your agent (if you have one)	Barker Brettell		
	"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)	138 Hagley Road Edgbaston Birmingham B16 9PW		
	Patents ADP number (if you know it)	7442494002 ✓		
6.	If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number	Country	Priority application number (if you know it)	Date of Filing (day/month/year)
7.	If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application	Number of earlier application		Date of filing (day/month/year)
8.	Is a statement of inventorship and of right to grant of a patent required in support of this request (Answer 'Yes' if: a) any applicant named in part 3 is not an inventor, or b) there is an inventor who is not named as an applicant, or c) any named applicant is a corporate body. See note (d))	YES		

Patents Form 1/77

Enter number of sheets for any of the following items you are filing with this form.
Do not count copies of the same document

Continuation sheets of this form -

Description 5 + 5

Claim(s) 3 + 3

Abstract -

Drawing(s) -

10. If you are also filing any of the following, state how many against each item.

Priority documents -

Translations of priority documents -

Statement of inventorship and right to grant of a patent (*Patents Form 7/77*) -

Request for preliminary examination 1
(*Patents Form 9/77*)

Request for substantive examination -
(*Patents Form 10/77*)

Any other documents -
(*please specify*)

11. I/We request the grant of a patent on the basis of this application.

Signature
Barker Brettell
Barker Brettell

Date
28 January 2003

12. Name and daytime telephone number of person to contact in the United Kingdom
Colin D. Kinton
Tel: 0121 456 1364

Warning

After an application for a patent has been filed, the Comptroller of the Patent Office will consider whether publication or communication of the invention should be prohibited or restricted under Section 22 of the Patents Act 1977. You will be informed if it is necessary to prohibit or restrict your invention in this way. Furthermore, if you live in the United Kingdom, Section 23 of the Patents Act 1977 stops you from applying for a patent abroad without first getting written permission from the Patent Office unless an application has been filed at least 6 weeks beforehand in the United Kingdom for a patent for the same invention and either no direction prohibiting publication or communication has been given, or any such direction has been revoked.

Notes

- If you need help to fill in this form or you have any questions, please contact the Patent Office on 01645 500505
- Write your answers in capital letters using black ink or you may type them.
- If there is not enough space for all the relevant details on any part of this form, please continue on a separate sheet of paper and write "see continuation sheet" in the relevant part(s). Any continuation sheet should be attached to this form.
- If you have answered 'Yes' Patents Form 7/77 will need to be filed.
- Once you have filled in the form you must remember to sign and date it.
- For details of the fee and ways to pay please contact the Patent Office.

TREATING SLURRIES

This invention relates to a composition for treating inorganic slurries and to a method of treating inorganic slurries with the aforesaid composition
5 so as to maintain the slurries in a substantially homogeneous phase.

The present invention will be described herein with particular reference to calcium carbonate-based slurries, especially those used in paper-making processes, although it is not to be construed as being limited thereto.
10

Most inorganic slurries contain about 70% to 80% by weight of solids. Many inorganic slurries (particularly those based on calcium carbonate) are known to be susceptible to bacterial contamination and it has been the practice to add one or more biocidally-active materials to the slurries in
15 order to minimise such contamination.

Phosphorus-containing compounds, in particular tetrakis(hydroxyorgano)phosphonium salts (THP⁺ salts) are known to be effective biocides. Experimental work carried out by the applicants has
20 shown, for example, that the addition of a solution of tetrakis(hydroxymethyl)phosphonium sulphate (THPS) to a calcium carbonate-based slurry can give rise to a reduction in bacterial count of 10⁴ in 2 hours.

25 However, it is also known that addition of THPS alone to a slurry results in instantaneous heterogeneous thickening and aggregation of the slurry.

The applicants have found that the use of a composition comprising a THP⁺ salt and a dispersant will provide continuing preservation against
30 bacterial contamination, while at the same time maintaining the slurry in a substantially homogeneous phase.

Accordingly, in a first aspect, the present invention provides a composition for treating an inorganic slurry, the composition comprising:

5 (a) a tetrakis(hydroxyorgano)phosphonium salt (hereinafter THP⁺ salt);

and

(b) a dispersant selected from the group consisting of:

10

(i) phosphonated compounds containing at least one tertiary nitrogen atom;

(ii) phosphonated oligomers of unsaturated acids;

15

(iii) homopolymers of unsaturated acids;

and (iv) polyphosphates.

20 In accordance with the present invention, the THP⁺ salt is preferably tetrakis(hydroxymethyl)phosphonium sulphate.

Alternatively, the THP⁺ salt may be tetrakis(hydroxymethyl)phosphonium chloride, phosphate, nitrate or oxalate.

25

A preferred example of a dispersant of the type (b)(i) is a compound having one tertiary nitrogen atom, such as a sodium salt of nitrilotris(methylene phosphate), particularly the tetra-sodium salt.

30 Preferred examples of dispersants of the type (b)(ii) include those oligomers having the general $H(CH_2OM.CH_2OM)_nPO_3M_2$, wherein M is a

cationic species such that the oligomer is soluble in water and n is a number greater than 1.

Other suitable oligomers are disclosed in the applicant's European Patent
5 Specification 0 491 391.

A preferred example of a dispersant of the type (b)(iii) is a homopolymer of acrylic acid, especially a homopolymer having a molecular weight in the range 2000 to 5000.

10

Preferred examples of dispersants of the type b(iv) include sodium tripolyphosphate.

In a second aspect, the present invention provides a method of treating an
15 inorganic slurry to maintain the slurry in a substantially homogeneous phase, the method comprising the addition to the slurry of an effective amount of a composition according to the first aspect of the present invention.

20 The inorganic slurry may, for example, comprise a calcium carbonate-based slurry.

Alternatively, the inorganic slurry may comprise a pigment slurry, a clay slurry or a cement slurry.

25

Preferably, the ratio of THP⁺ salt to dispersant in the composition is about 2:1 (as active ingredients).

Suitably, the composition may be added to the slurry in an amount in the
30 range 10ppm to 1000ppm (by weight of the slurry), for example about 750ppm (by weight of the slurry).

The present invention will be illustrated by way of the following examples.

- 5 In the examples, a 75% calcium carbonate slurry (commercially known as Setacarb) was treated with:

Example 1 : THP⁺ salt alone.

- 10 Example 2 : THP⁺ salt and dispersant of type (b)(i).

Example 3 : THP⁺ salt and dispersant of type (b)(ii).

15 The amounts of each additive used, and the results, are given in the TABLE below.

TABLE

Example No.	THP ⁺ salt (ppm)	Dispersant (ppm)	Result
1	(a) THPS 750ppm	(b) (nil)	Instant heterogeneous thickening
25 2	(a) THPS 750ppm	b(i) 375ppm	No thickening
3	(a) THPS 750ppm	b(ii) 375ppm	No thickening

Notes to TABLE

- (a) An aqueous solution of tetrakis(hydroxymethyl)phosphonium sulphate (75% a.i.), available as TOLCIDE®-PS75.
- 5
- (b)(i) An aqueous solution of the tetra sodium salt of nitrilotris(methylene phosphonic acid), available as BRIQUEST® 301-32S.
- 10 (b)(ii) A homopolymer of polyacrylic acid, having a molecular weight in the range 2000-5000 and available as BEVALOID®211.

CLAIMS

1. A composition for treating an inorganic slurry, the composition comprising:

5

(a) a tetrakis(hydroxyorgano)phosphonium salt (herein THP⁺ salt);

and

10 (b) a dispersant selected from the group consisting of:

(i) phosphonated compounds containing at least one tertiary nitrogen atom;

15 (ii) phosphonated oligomers of unsaturated acids;

(iii) homopolymers of unsaturated acids;

and (iv) polyphosphates.

20

2. A composition according to Claim 1, in which the THP⁺ salt is tetrakis(hydroxymethyl)phosphonium sulphate.

3. A composition according to Claim 1, in which the THP⁺ salt is
25 tetrakis(hydroxymethyl)phosphonium chloride, phosphate, nitrate or oxalate.

4. A composition according to any one of Claims 1 to 3, in which the
dispersant (b(i)) is a phosphonated compound containing one tertiary
30 nitrogen atom.

5. A composition according to Claim 4, in which the dispersant (b(i)) is a sodium salt of nitrilo-tris(methylene phosphonate).
6. A composition according to Claim 5, in which the salt is the tetra-sodium salt.
7. A composition according to any one of Claims 1 to 3, in which the dispersant (b(ii)) is a phosphonated oligomer of maleic acid.
8. A composition according to Claim 7, in which the oligomer has the general formula $H(CH_2OM.CH_2OM)_n PO_3M_2$, wherein M is a cationic species such that the oligomer is soluble in water and n is a number greater than 1.
9. A composition according to any one of Claims 1 to 3, in which the dispersant (b(iii)) is a homopolymer of acrylic acid.
10. A composition according to Claim 9, in which the homopolymer has a molecular weight in the range 2000 to 5000.
11. A composition according to any one of Claims 1 to 3, in which the dispersant (b(iv)) is sodium tripolyphosphate.
12. A method of treating an inorganic slurry to maintain the slurry in a substantially homogeneous phase, the method comprising the addition to the slurry of an effective amount of a composition according to any one of Claims 1 to 11.
13. A method according to Claim 12, in which the ratio of THP⁺ salt to dispersant in the composition is about 2:1 (as active ingredients).

14. A method according to Claim 12 or 13, in which the composition is added to the slurry in an amount in the range 10ppm to 1000ppm (by weight of the slurry).
- 5 15. A method according to Claim 14, in which the composition is added to the slurry in an amount of about 750ppm (by weight of the slurry).
- 10 16. A method according to any one of Claims 12 to 15, in which the slurry comprises a calcium carbonate-based slurry.
17. A method according to any one of Claims 12 to 15, in which the slurry comprises a pigment slurry, a clay slurry or a cement slurry.
- 15 18. A method of treating an inorganic slurry, substantially as hereinbefore described with reference to the Examples.

PCT Application
PCT/GB2004/000056

